OIPE
MAY 02 2005
PATENT & TRADEMARK OFFICE 1637

10

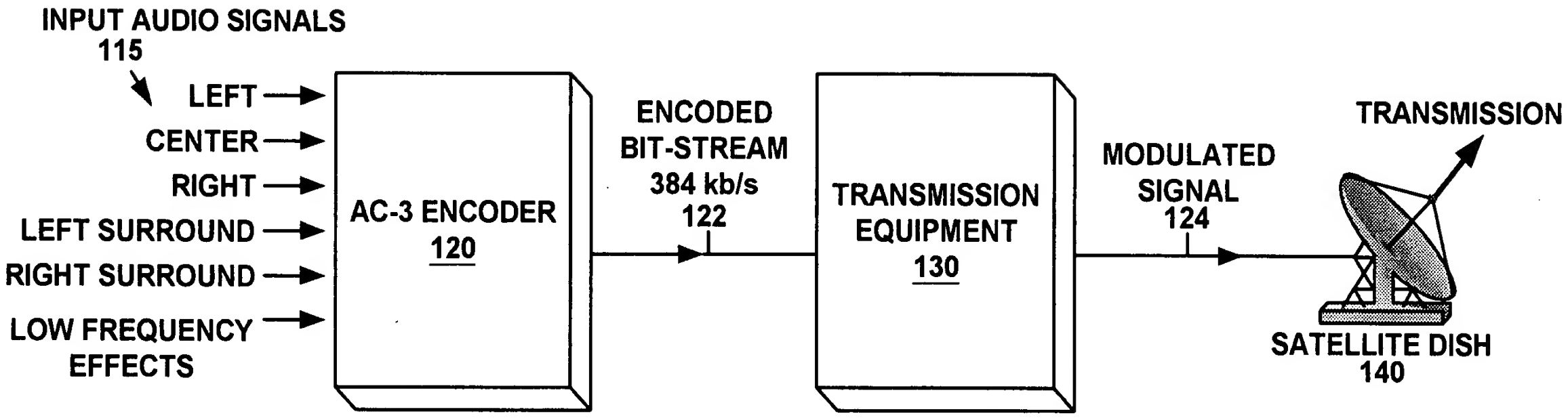


FIGURE 1A

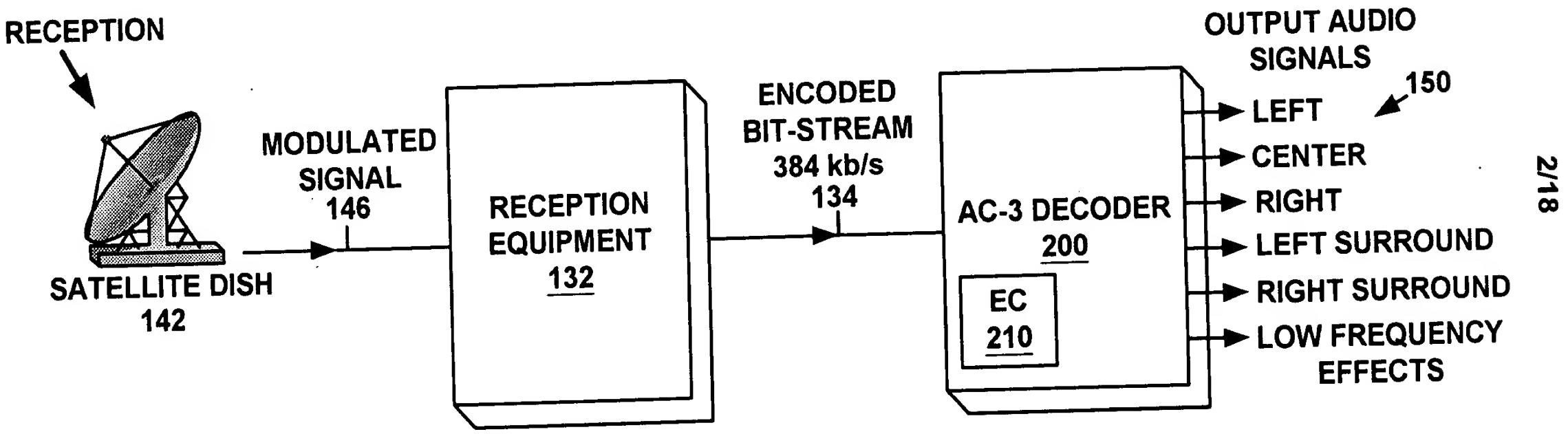

RECEPTION
SATELLITE DISH
142
MODULATED
SIGNAL
146
RECEPTION
EQUIPMENT
132
ENCODED
BIT-STREAM
384 kb/s
134
AC-3 DECODER
200
EC
210
OUTPUT AUDIO
SIGNALS
150
LEFT
CENTER
RIGHT
LEFT SURROUND
RIGHT SURROUND
LOW FREQUENCY
EFFECTS

FIGURE 1B

134

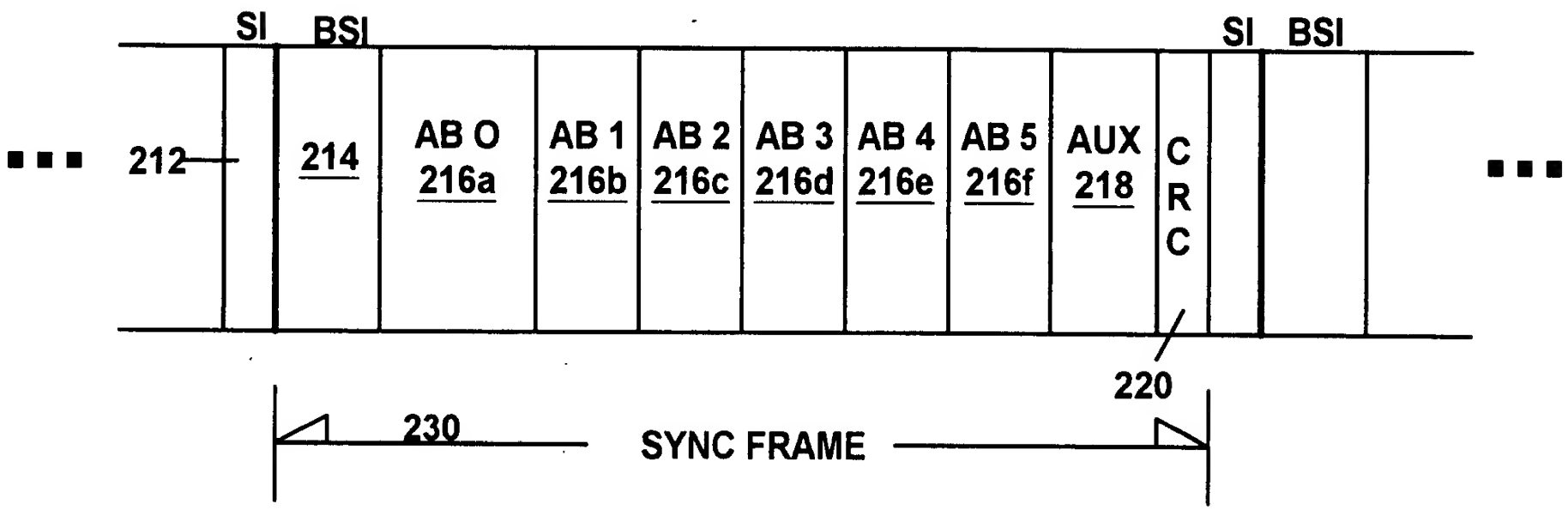
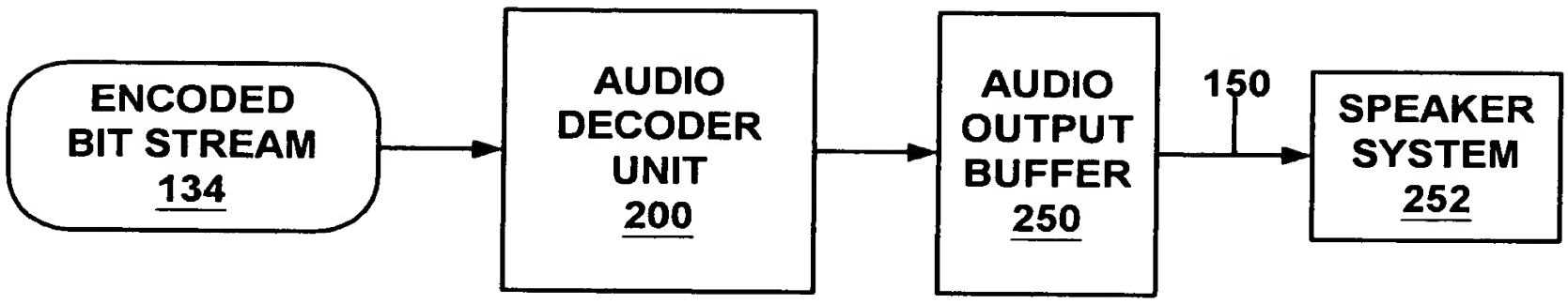

SI
BSI
SI
BSI
212
214
AB O 216a
AB 1 216b
AB 2 216c
AB 3 216d
AB 4 216e
AB 5 216f
AUX 218
CRC
220
230
SYNC FRAME

FIGURE 2


ENCODED
BIT STREAM
134
AUDIO
DECODER
UNIT
200
AUDIO
OUTPUT
BUFFER
250
150
SPEAKER
SYSTEM
252

FIGUR E 3A

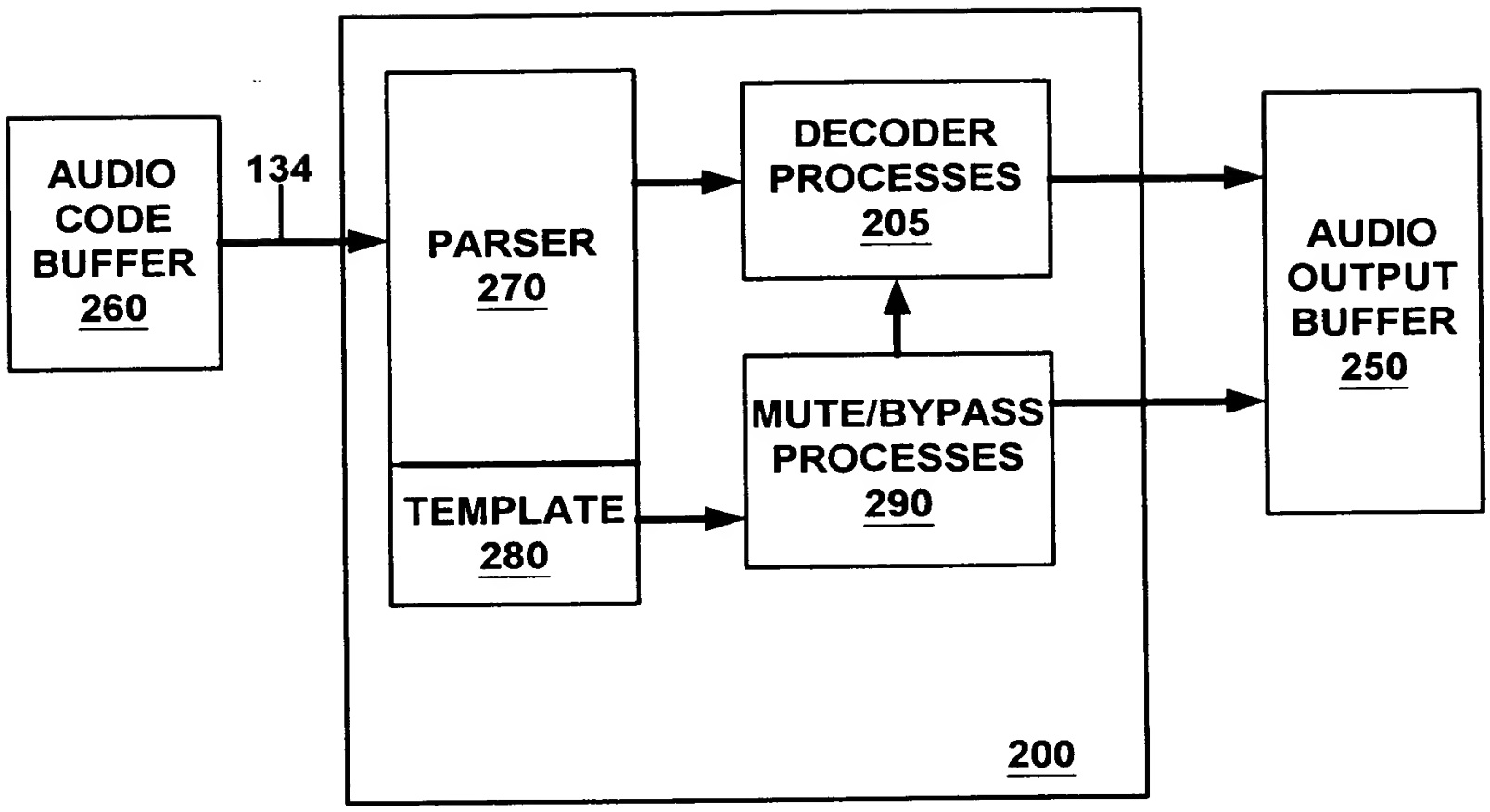

AUDIO CODE BUFFER 260
134
PARSER 270
TEMPLATE 280
DECODER PROCESSES 205
MUTE/BYPASS PROCESSES 290
AUDIO OUTPUT BUFFER 250
200

FIGURE 3B

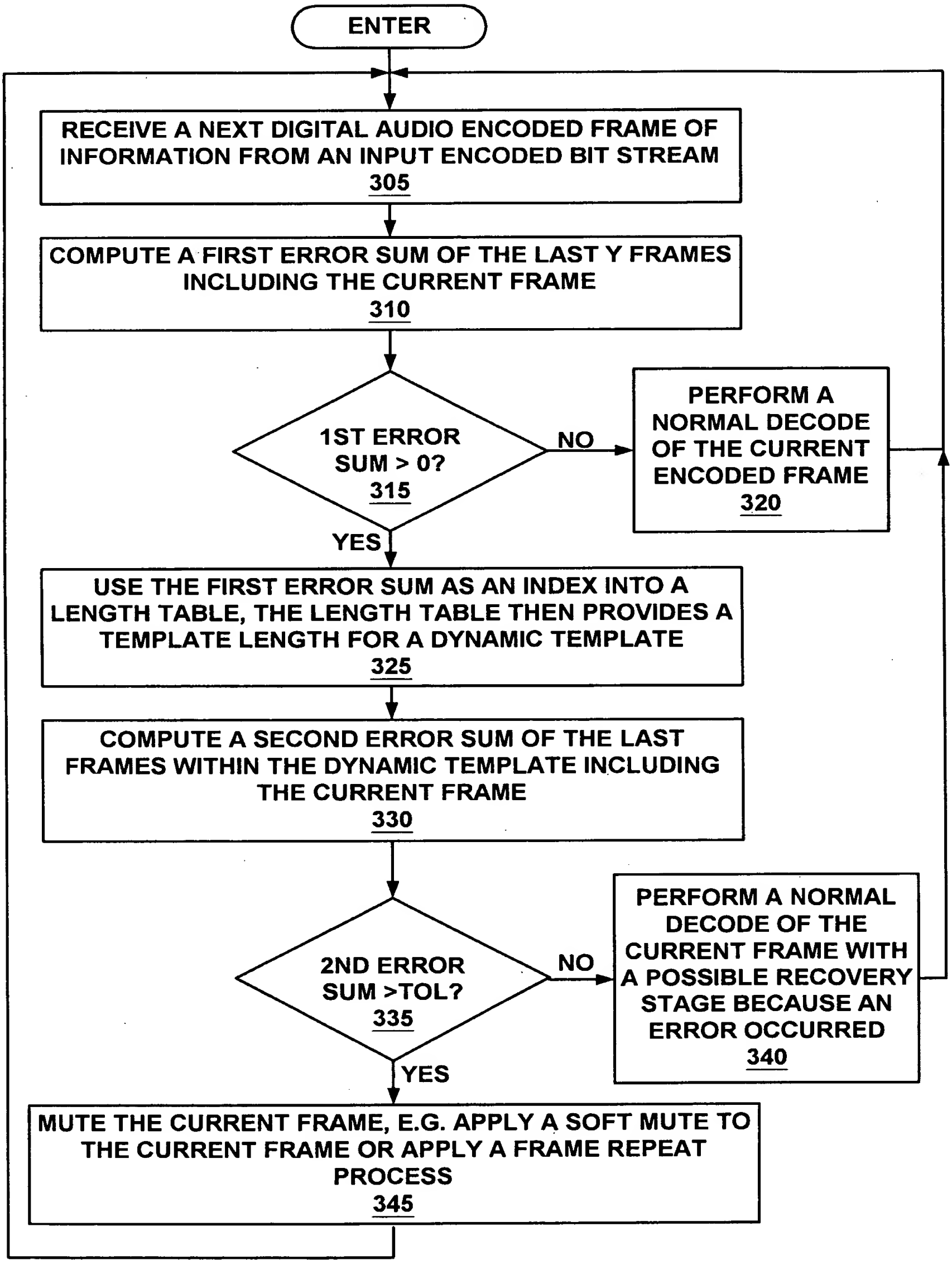
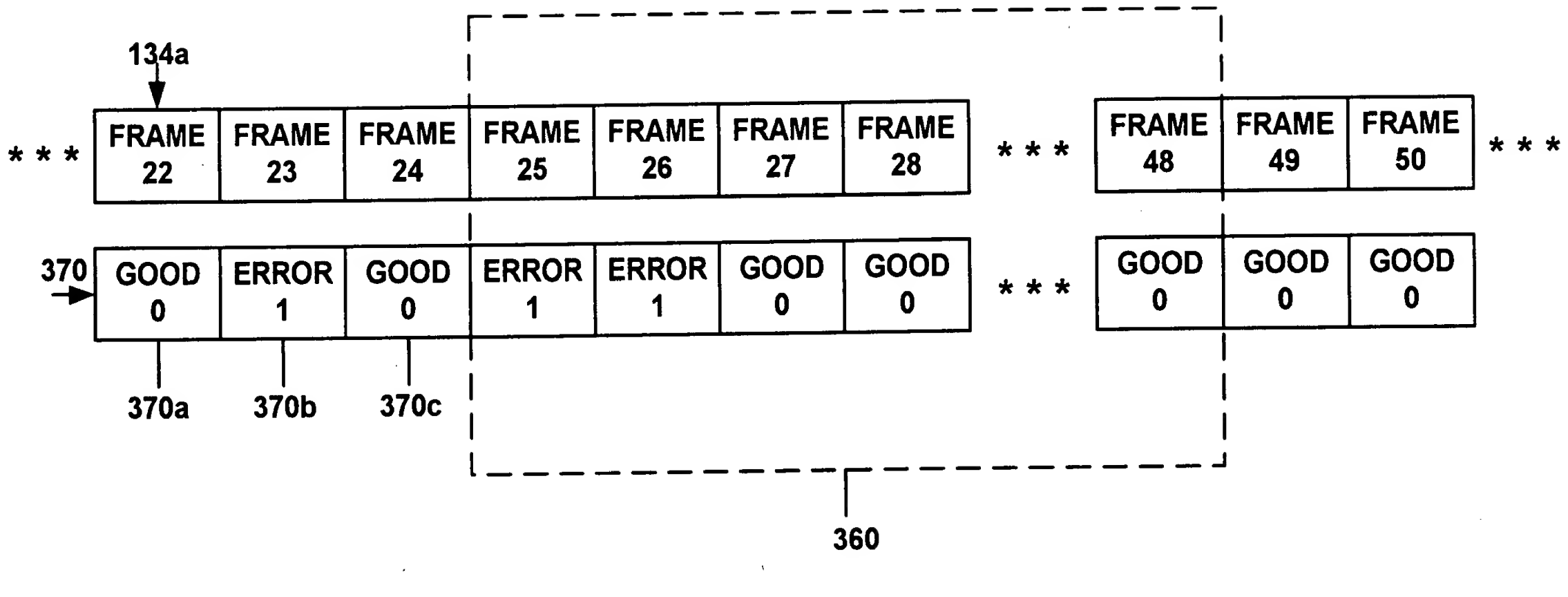

ENTER
RECEIVE A NEXT DIGITAL AUDIO ENCODED FRAME OF INFORMATION FROM AN INPUT ENCODED BIT STREAM
305
COMPUTE A FIRST ERROR SUM OF THE LAST Y FRAMES INCLUDING THE CURRENT FRAME
310
1ST ERROR SUM > 0?
315
NO
PERFORM A NORMAL DECODE OF THE CURRENT ENCODED FRAME
320
YES
USE THE FIRST ERROR SUM AS AN INDEX INTO A LENGTH TABLE, THE LENGTH TABLE THEN PROVIDES A TEMPLATE LENGTH FOR A DYNAMIC TEMPLATE
325
COMPUTE A SECOND ERROR SUM OF THE LAST FRAMES WITHIN THE DYNAMIC TEMPLATE INCLUDING THE CURRENT FRAME
330
2ND ERROR SUM >TOL?
335
NO
PERFORM A NORMAL DECODE OF THE CURRENT FRAME WITH A POSSIBLE RECOVERY STAGE BECAUSE AN ERROR OCCURRED
340
YES
MUTE THE CURRENT FRAME, E.G. APPLY A SOFT MUTE TO THE CURRENT FRAME OR APPLY A FRAME REPEAT PROCESS
345

FIGURE 4



7/18

FIGURE 5A

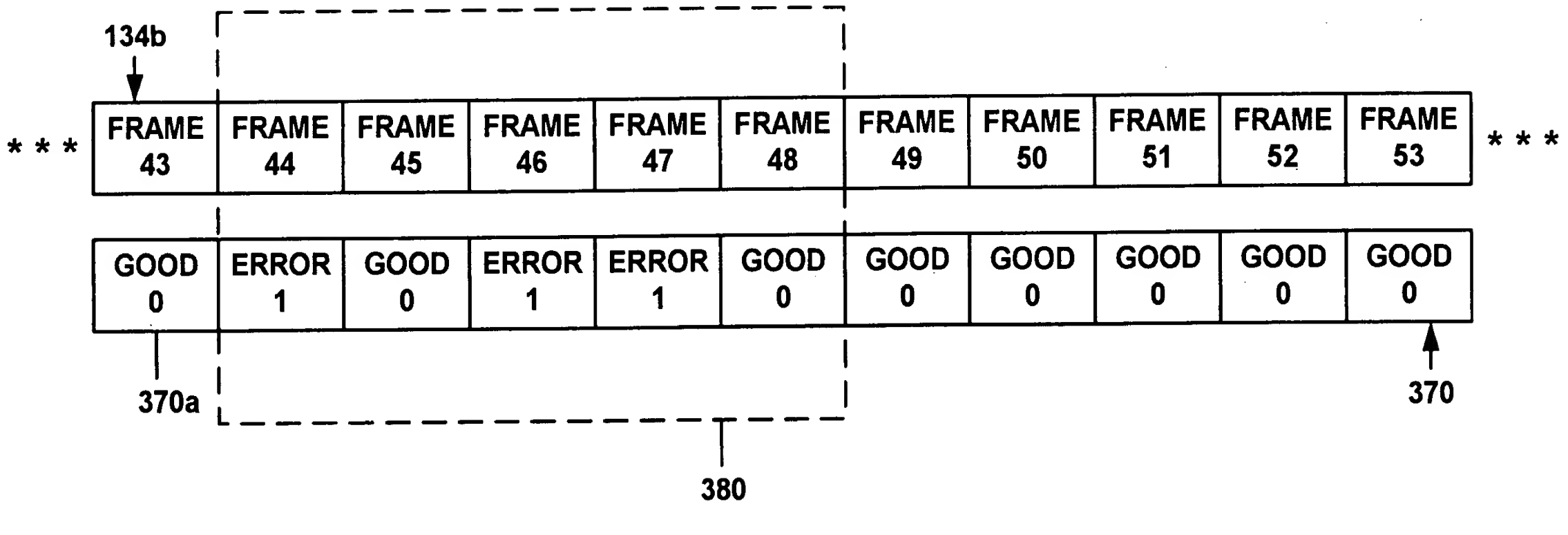

134b
* * *
FRAME 43
FRAME 44
FRAME 45
FRAME 46
FRAME 47
FRAME 48
FRAME 49
FRAME 50
FRAME 51
FRAME 52
FRAME 53
* * *
GOOD 0
ERROR 1
GOOD 0
ERROR 1
ERROR 1
GOOD 0
GOOD 0
GOOD 0
GOOD 0
GOOD 0
GOOD 0
370a
370
380

FIGURE 5B

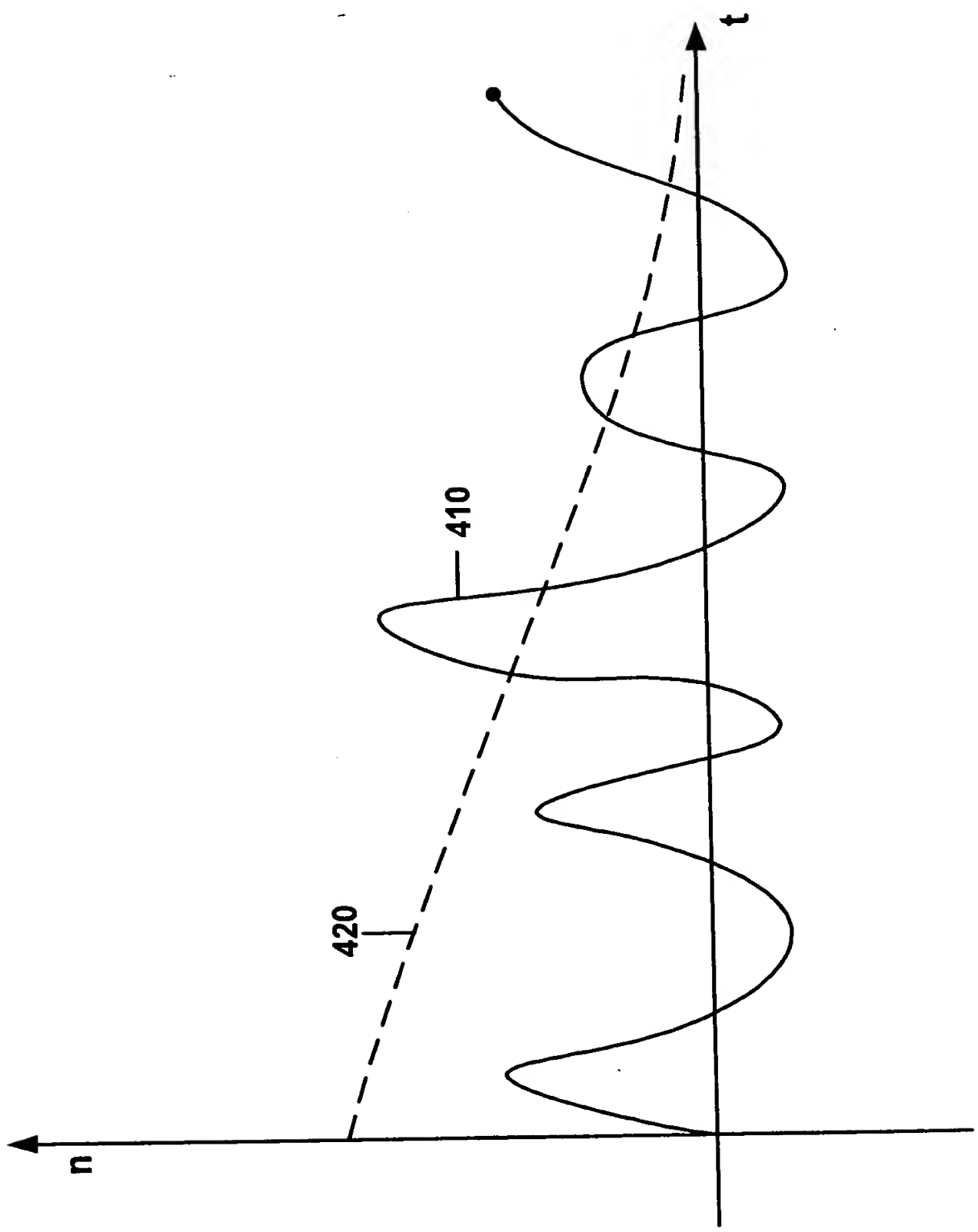


FIGURE 6

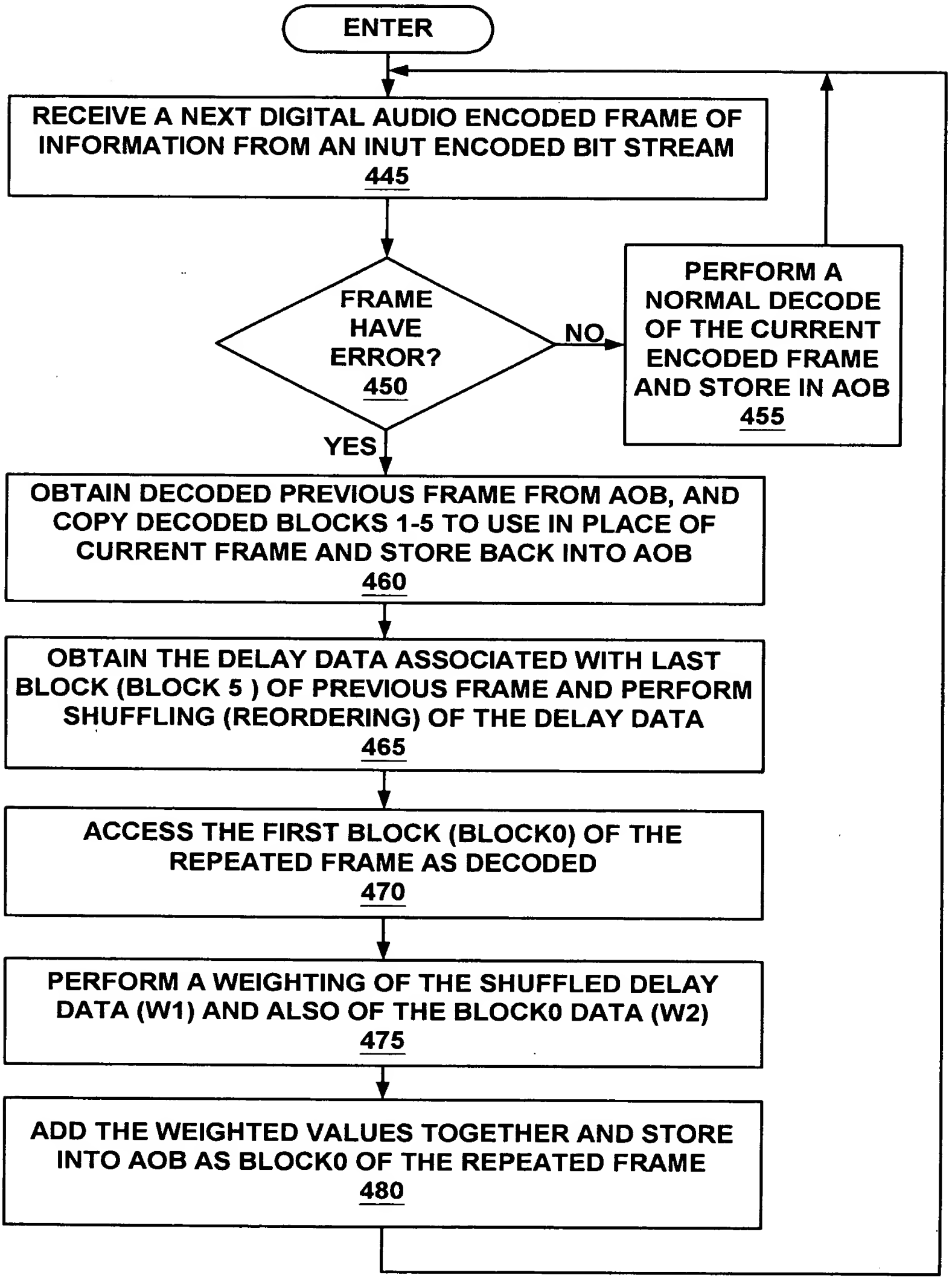
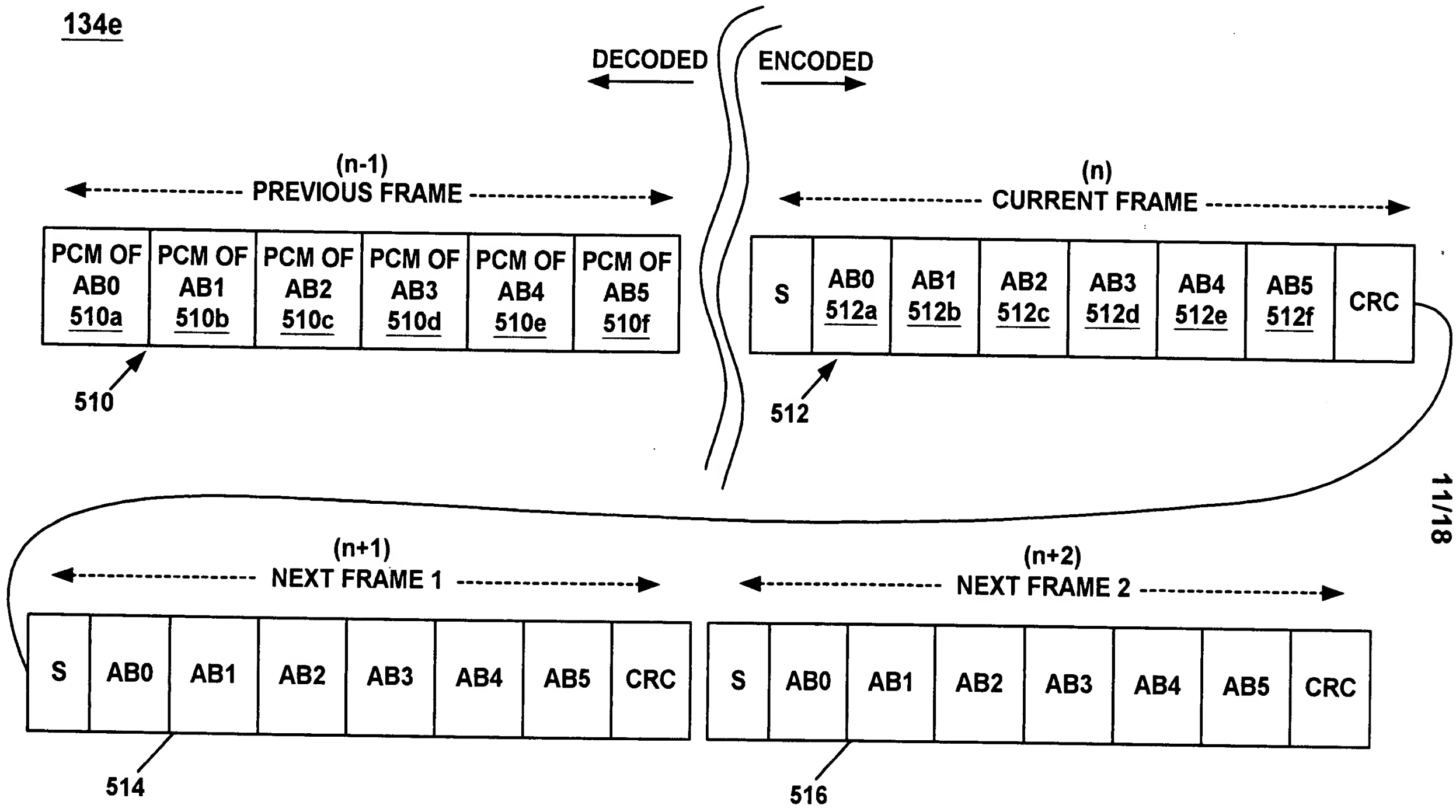

ENTER
RECEIVE A NEXT DIGITAL AUDIO ENCODED FRAME OF INFORMATION FROM AN INUT ENCODED BIT STREAM
445
FRAME HAVE ERROR?
450
NO
PERFORM A NORMAL DECODE OF THE CURRENT ENCODED FRAME AND STORE IN AOB
455
YES
OBTAIN DECODED PREVIOUS FRAME FROM AOB, AND COPY DECODED BLOCKS 1-5 TO USE IN PLACE OF CURRENT FRAME AND STORE BACK INTO AOB
460
OBTAIN THE DELAY DATA ASSOCIATED WITH LAST BLOCK (BLOCK 5) OF PREVIOUS FRAME AND PERFORM SHUFFLING (REORDERING) OF THE DELAY DATA
465
ACCESS THE FIRST BLOCK (BLOCK0) OF THE REPEATED FRAME AS DECODED
470
PERFORM A WEIGHTING OF THE SHUFFLED DELAY DATA (W1) AND ALSO OF THE BLOCK0 DATA (W2)
475
ADD THE WEIGHTED VALUES TOGETHER AND STORE INTO AOB AS BLOCK0 OF THE REPEATED FRAME
480

FIGURE 7



11/18

FIGURE 8

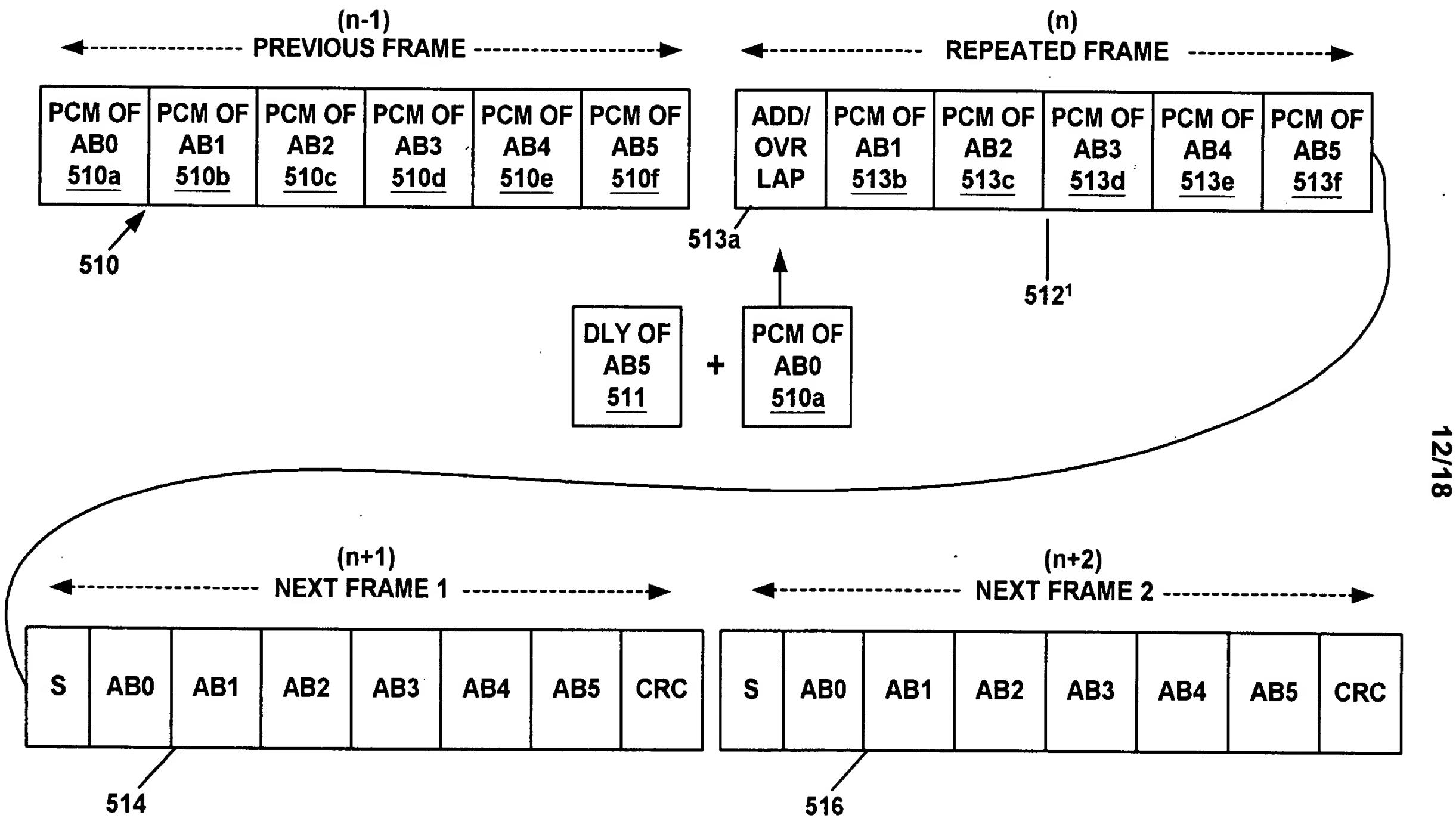

134d
(n-1)
PREVIOUS FRAME
(n)
REPEATED FRAME
PCM OF AB0 510a
PCM OF AB1 510b
PCM OF AB2 510c
PCM OF AB3 510d
PCM OF AB4 510e
PCM OF AB5 510f
ADD/ OVR LAP
PCM OF AB1 513b
PCM OF AB2 513c
PCM OF AB3 513d
PCM OF AB4 513e
PCM OF AB5 513f
510
513a
512¹
DLY OF AB5 511
+
PCM OF AB0 510a
(n+1)
NEXT FRAME 1
(n+2)
NEXT FRAME 2
S
AB0
AB1
AB2
AB3
AB4
AB5
CRC
514
516

FIGURE 9

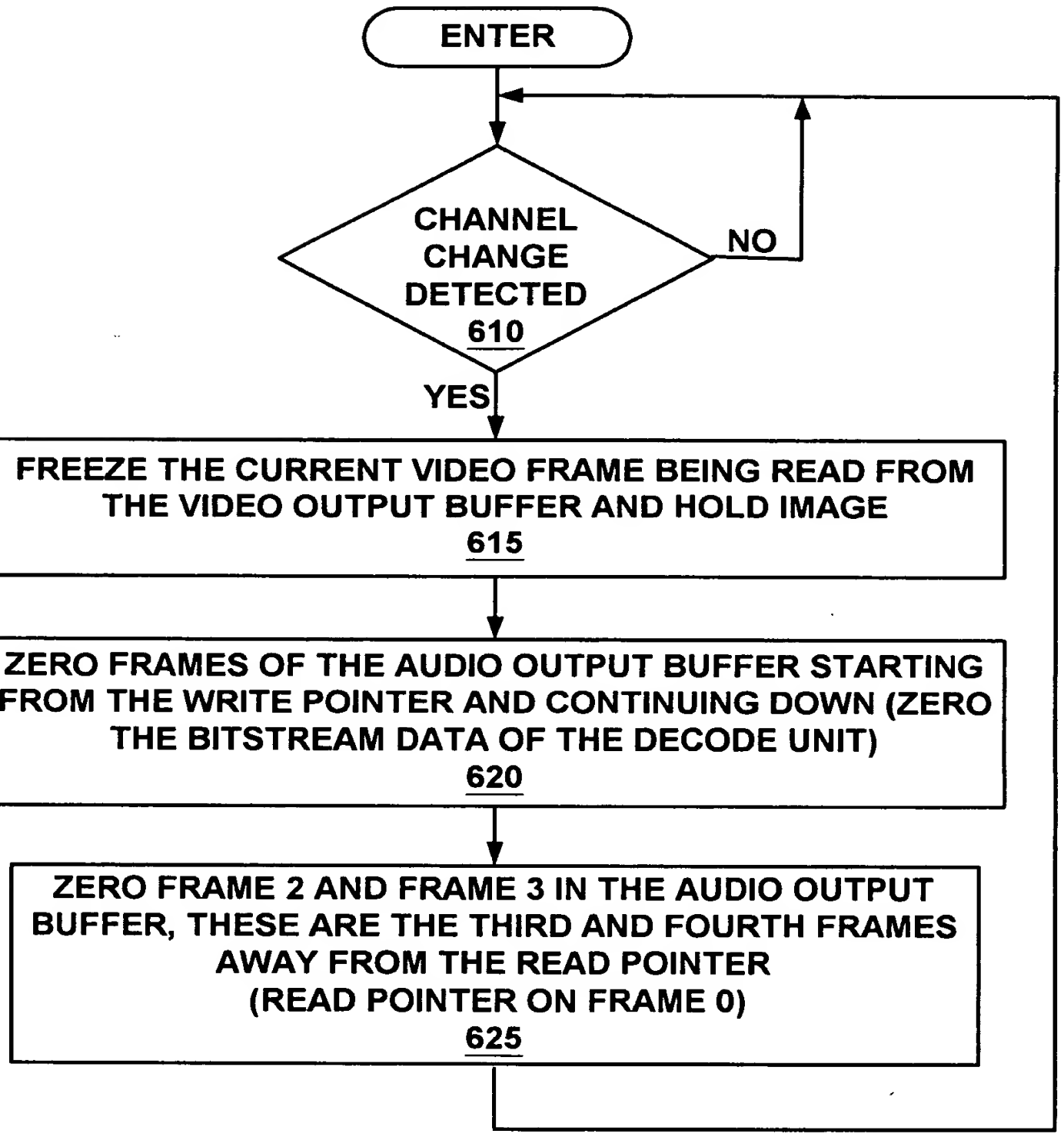

ENTER
CHANNEL CHANGE DETECTED 610
NO
YES
FREEZE THE CURRENT VIDEO FRAME BEING READ FROM THE VIDEO OUTPUT BUFFER AND HOLD IMAGE 615
ZERO FRAMES OF THE AUDIO OUTPUT BUFFER STARTING FROM THE WRITE POINTER AND CONTINUING DOWN (ZERO THE BITSTREAM DATA OF THE DECODE UNIT) 620
ZERO FRAME 2 AND FRAME 3 IN THE AUDIO OUTPUT BUFFER, THESE ARE THE THIRD AND FOURTH FRAMES AWAY FROM THE READ POINTER (READ POINTER ON FRAME 0) 625

FIGURE 10

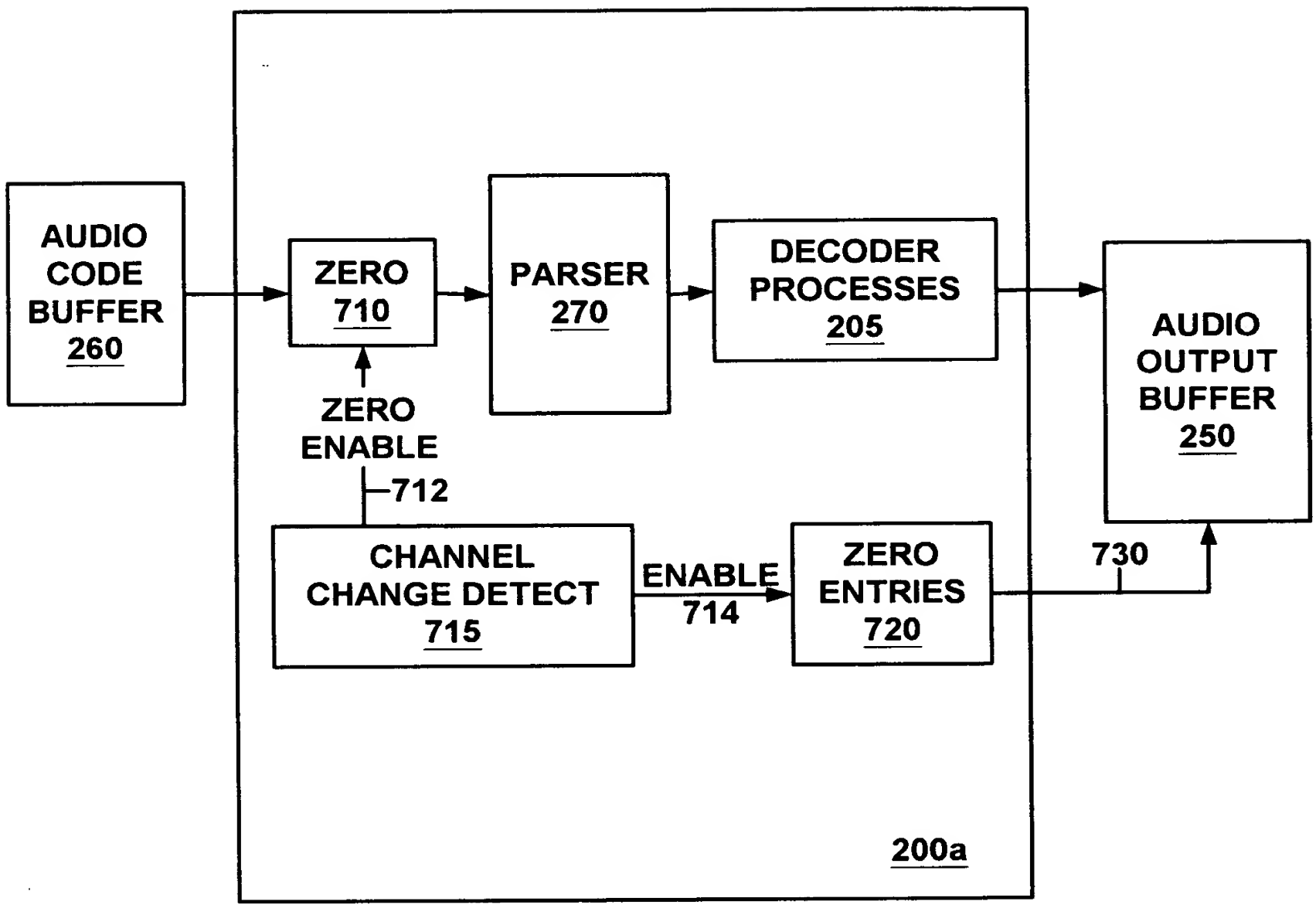

AUDIO CODE BUFFER 260
ZERO 710
ZERO ENABLE 712
PARSER 270
DECODER PROCESSES 205
AUDIO OUTPUT BUFFER 250
CHANNEL CHANGE DETECT 715
ENABLE 714
ZERO ENTRIES 720
730
200a

FIGURE 11

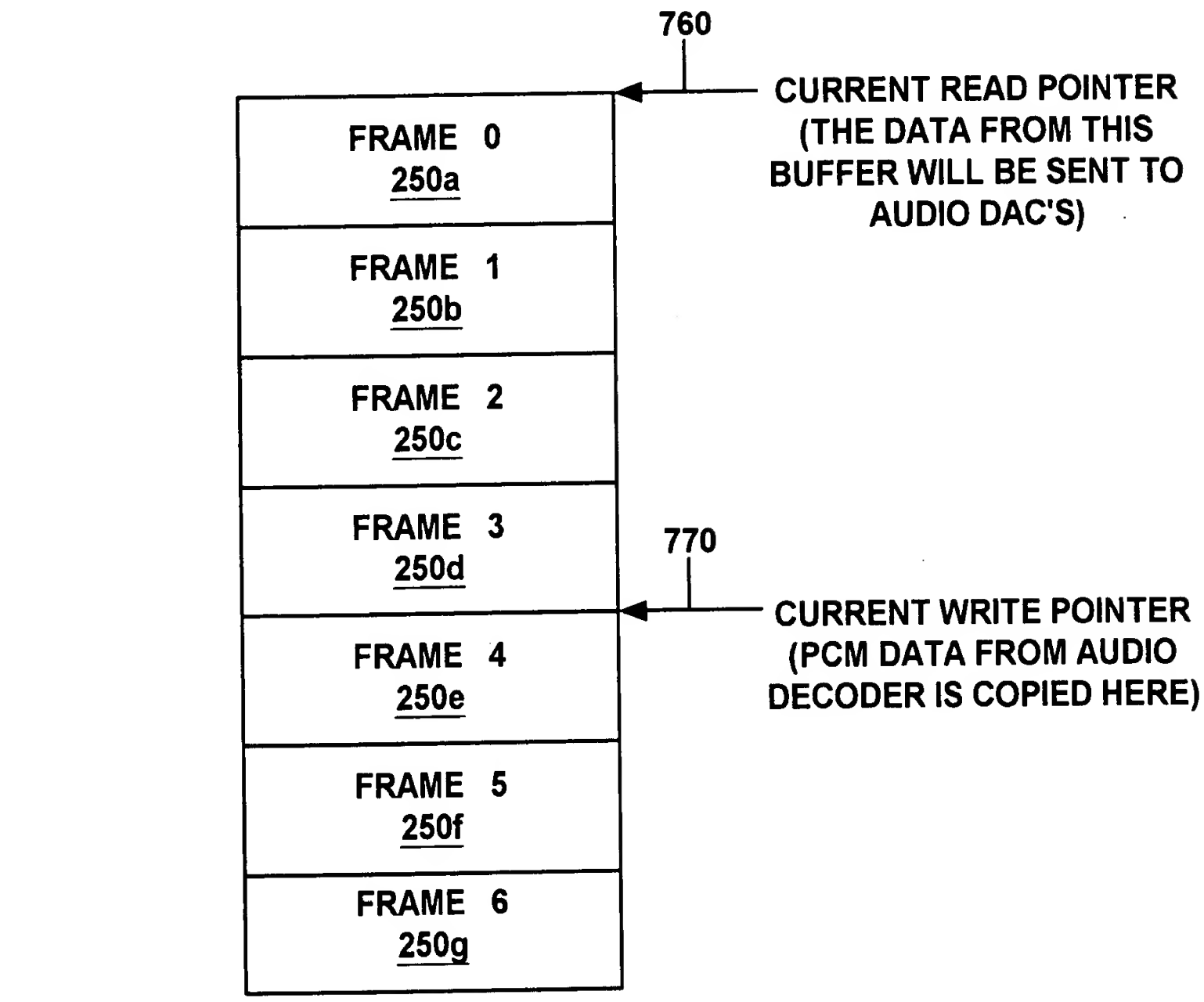

250
760
CURRENT READ POINTER
(THE DATA FROM THIS
BUFFER WILL BE SENT TO
AUDIO DAC'S)
FRAME 0
250a
FRAME 1
250b
FRAME 2
250c
FRAME 3
250d
770
CURRENT WRITE POINTER
(PCM DATA FROM AUDIO
DECODER IS COPIED HERE)
FRAME 4
250e
FRAME 5
250f
FRAME 6
250g

FIGURE 12

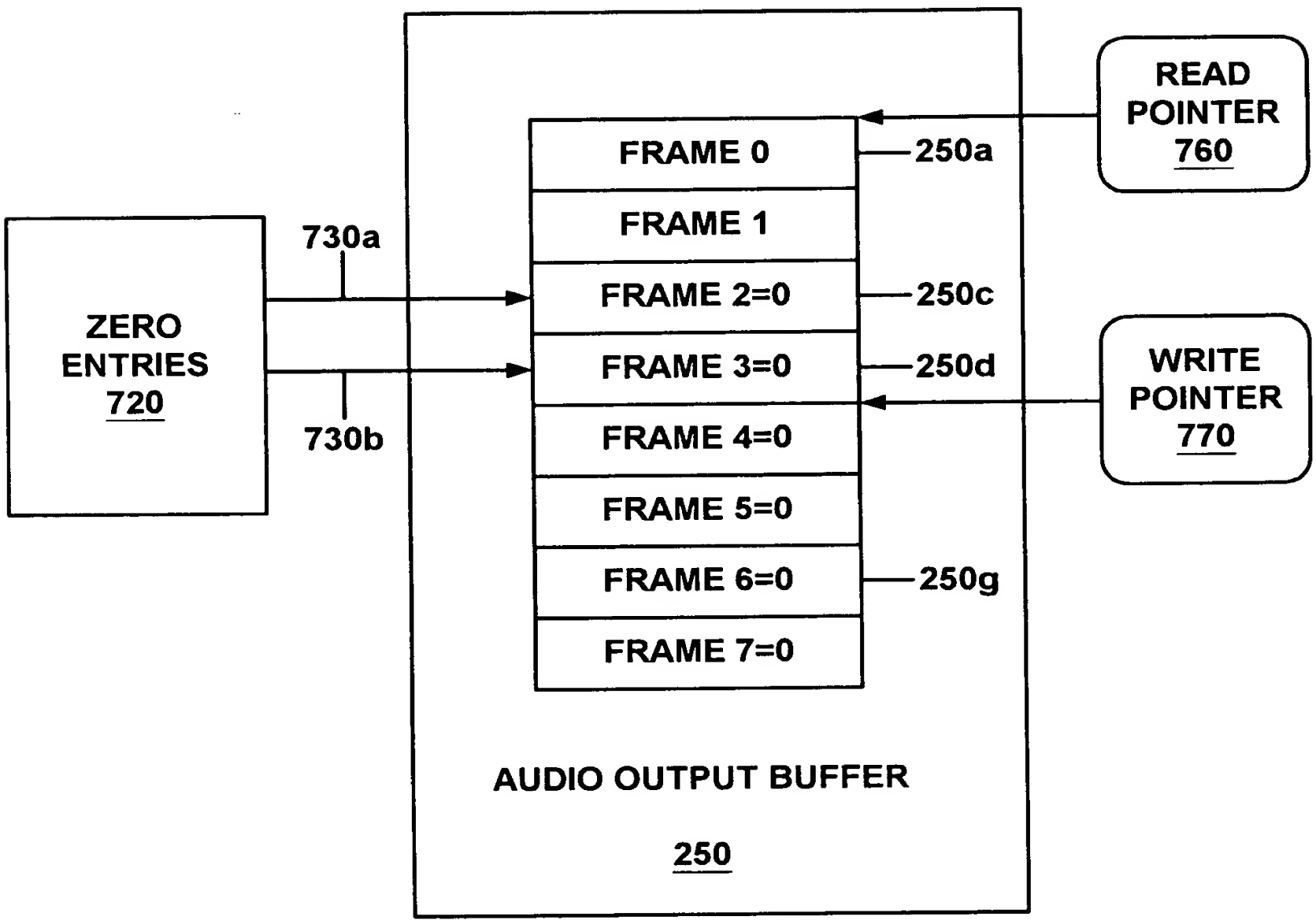

READ POINTER 760
FRAME 0
250a
FRAME 1
730a
ZERO ENTRIES 720
FRAME 2=0
250c
FRAME 3=0
250d
WRITE POINTER 770
730b
FRAME 4=0
FRAME 5=0
FRAME 6=0
250g
FRAME 7=0
AUDIO OUTPUT BUFFER
250

FIGURE 13

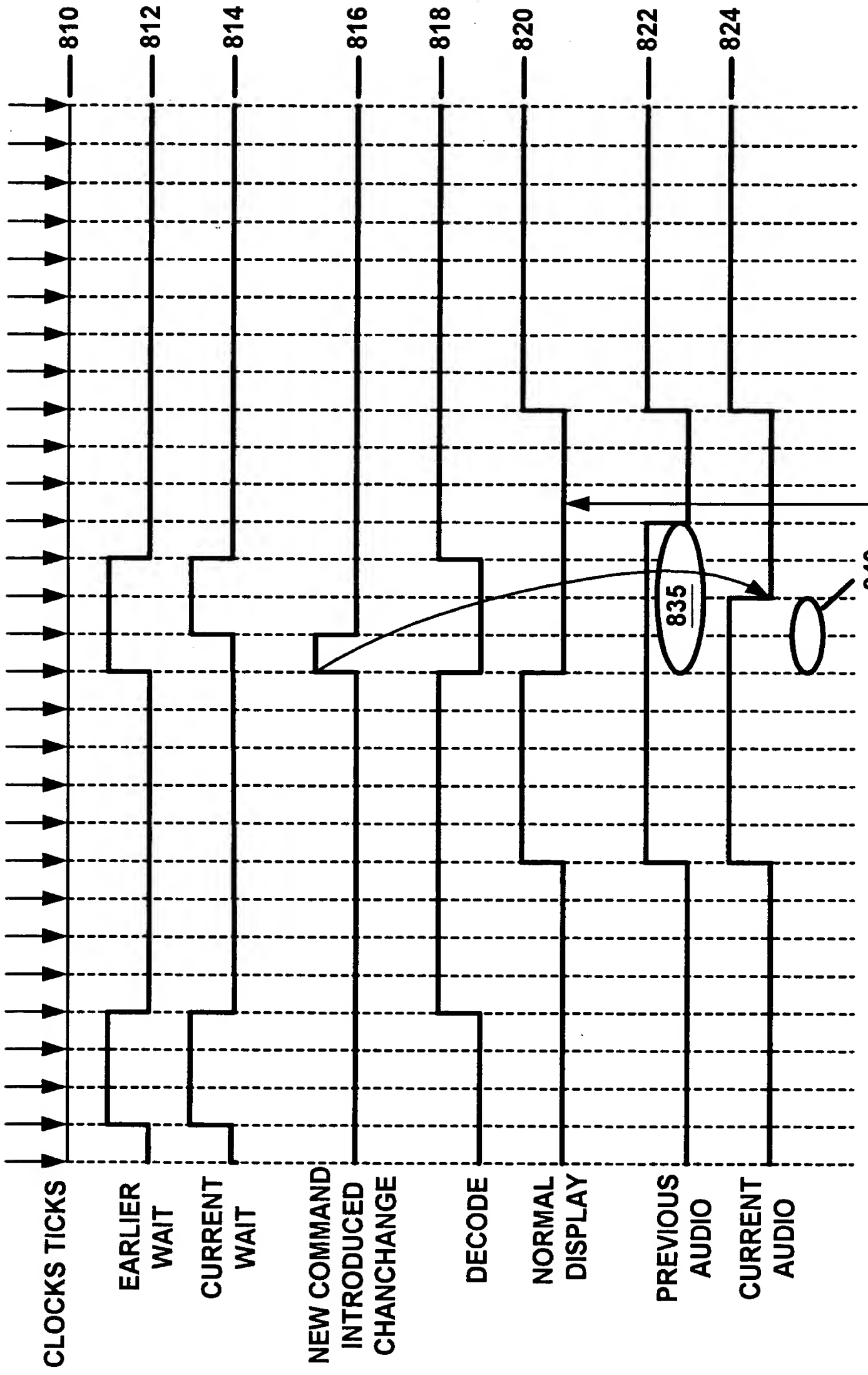

810
812
814
816
818
820
822
824
830
835
840
CLOCKS TICKS
EARLIER WAIT
CURRENT WAIT
NEW COMMAND INTRODUCED CHANCHANGE
DECODE
NORMAL DISPLAY
PREVIOUS AUDIO
CURRENT AUDIO

FIGURE 14

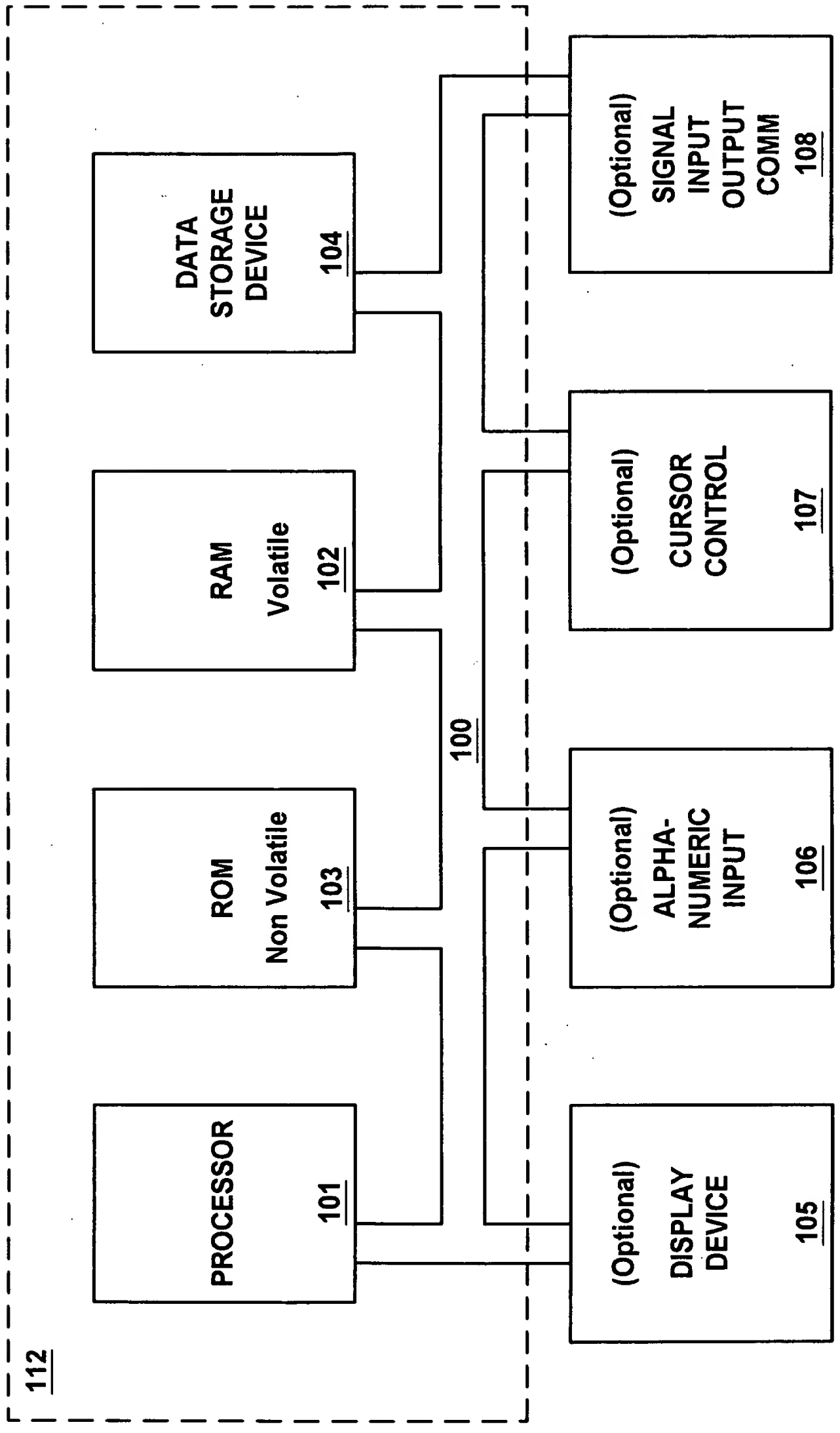

112
PROCESSOR
101
ROM
Non Volatile
103
RAM
Volatile
102
DATA
STORAGE
DEVICE
104
100
(Optional)
DISPLAY
DEVICE
105
(Optional)
ALPHA-
NUMERIC
INPUT
106
(Optional)
CURSOR
CONTROL
107
(Optional)
SIGNAL
INPUT
OUTPUT
COMM
108

FIGURE 15